

## **Response Action Plan**

### ***Bassett Creek Main Stem Erosion Repair Project, Minneapolis, Minnesota (PB4955/VP33640)***

Prepared for  
Bassett Creek Watershed Management Commission, the City of  
Minneapolis, and Hennepin County Environment and Energy  
Department

August 2016

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Response Action Plan  
Bassett Creek Main Stem Erosion Repair Project  
Minneapolis, Minnesota  
PB4955/VP33640

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Contents

1.0 Introduction ..... 1

2.0 Background ..... 2

    2.1 Summary of Environmental Information ..... 2

    2.2 Description of Project Work ..... 3

3.0 Response Action Objectives ..... 4

4.0 Response Action Plan ..... 6

    4.1 Response Actions ..... 6

        4.1.1 Environmental Oversight and Sampling ..... 6

        4.1.2 Excavated Soil Management ..... 6

        4.1.3 Soil Stockpiling, Loading and Transport ..... 7

        4.1.4 Creek Improvements ..... 7

        4.1.5 Import Material ..... 9

    4.2 Additional Tasks ..... 9

        4.2.1 Health and Safety ..... 9

        4.2.2 Contingency Plan ..... 9

        4.2.3 Permits ..... 9

5.0 Reporting and Schedule ..... 11

6.0 References ..... 12

## List of Figures

Figure 1	Project Location
Figure 2	Historical Soil Investigation Overview
Figure 3	2016 Phase II Soil Investigation Summary
Figure 4	Reach 1 Stabilization Sites
Figure 5	Reach 2 Stabilization Sites
Figure 6	Reach 3 Stabilization Sites
Figure 7	Conceptual Stabilization Techniques

## List of Appendices

Appendix A	Site Contingency Plan
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## Certifications

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PE #: add PE number	Date

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## 1.0 Introduction

Barr Engineering Co. (Barr) prepared this Response Action Plan (RAP) for the Bassett Creek Main Stem Erosion Repair Project (Project) in Minneapolis, Minnesota (Figure 1). Barr was retained by Hennepin County Environment and Energy Department by application to their Closeout of Assistance program." The Project is expected to be carried out by the Bassett Creek Watershed Management Commission (BCWMC) and the City of Minneapolis (City) in 2017-2018. The BCWMC's 2015 Watershed Management Plan addresses the need to repair and stabilize stream reaches damaged by erosion or affected by sedimentation. Erosion repair and creek bank stabilization within the Project area will provide water quality improvement by 1) repairing actively eroding sites and 2) preventing erosion at other sites by installing preemptive measures to protect stream banks.

The work will be completed within existing or planned easements held by the City and BCWMC, or under access agreements to be established with some property owners. The Project is not expected to result in ownership or land use changes in the Project area. The work will be done at several parcels owned by various entities located along a narrow urban creek corridor, from Cedar Lake Road to Dupont Avenue North and Second Avenue North, and along the Fruen Mill site between Glenwood Avenue North and the Soo Line Railroad Bridge. The Project area includes properties that have known environmental issues related to past land uses adjacent to the Project. The existing environmental issues have been documented through site assessment, reconnaissance and environmental sampling in the Project area and are known to extend well beyond the Project area limits based on the results of investigations at multiple environmental sites adjacent to the Project area (Barr, 2015a). The City and BCWMC enrolled the Project in the Minnesota Pollution Control Agency's (MPCA) voluntary brownfield program in 2015 and assigned numbers PB4955 (petroleum brownfield) and VP33640 (voluntary investigation and cleanup; VIC).

The objective of the Project is to stabilize the creek banks to reduce erosion and sedimentation in the creek. The creek stabilization/improvement Project will include grading and some limited excavation of existing creek bank and creek bed soils and the placement of engineered fill (i.e., rip rap) and bank stabilization features in areas where the creek bank is susceptible to further erosion. This RAP provides an overview of previous investigations and describes the technical approach and response action elements that have been designed to ensure that excavated soils are managed properly.

## 2.0 Background

The Project area has been divided into 3 reaches as shown on Figure 1: Reach 1 is adjacent to the Fruen Mill site, Reach 2 extends from Cedar Lake Road to Irving Avenue North and Reach 3 extends from Irving Avenue North to the tunnel inlet, plus the overflow section to Second Avenue North.

### 2.1 Summary of Environmental Information

A Phase I Environmental Site Assessment Report (Barr, 2015a) and a Phase II Environmental Site Investigation Work Plan (Barr, 2015b) for the Project area were submitted to the MPCA. The Phase II Work Plan was approved by the MPCA in January 2016. The Phase II investigation was conducted in February 2016 in accordance with the Work Plan. Results of the Phase II investigation were consistent with data collected during previous investigations (Barr, 2016a). The Phase II Investigation Report is being submitted to the MPCA with this RAP. (Note that the creek Reach numbers were revised following preparation of the Phase I and Phase II reports.)

A review of existing data and analytical results from the 2016 Phase II investigation indicates that soil near the Fruen Mill side of the creek in Reach 1, and along both sides of the creek in Reaches 2 and 3, has debris present and/or has chemical impacts and does not meet MPCA guidelines for unregulated fill, indicating the soil is not suitable for reuse at another site and requires landfill disposal (MPCA, 2012). Soil samples from these areas contained debris, diesel range organics (DROs) and/or concentrations of arsenic, mercury, lead, benzo(a)pyrene equivalents (B(a)P equivalents), volatile organic compounds (VOCs), above MPCA Residential soil reference values (SRV). Samples collected in the park across the creek from the Fruen Mill Area (Reach 1) met MPCA criteria for unregulated fill. Notable soil impacts are shown on Figure 2 (historical investigations) and Figure 3 (2016 Phase II results), and include the following:

- Lead concentrations above the characteristic limit for Resource Conservation Recovery Action (RCRA) Subtitle C (hazardous) waste have been identified in soils immediately adjacent to the creek east of Irving Avenue North, on the Irving Avenue Dump site and on the Minneapolis School District Transportation Center site in Reaches 2 and 3. In the past, lead stabilization of excavated soil has been conducted on several occasions to address the hazardous lead concentrations as part of construction work for the Bassett Creek tunnel and Van White Memorial Boulevard. A restrictive covenant is in place on the NSP/Xcel Energy parcel in Reach 3 to address remaining soil impacts. During the 2016 Phase II Investigation, lead concentrations were identified above the MPCA residential SRV (300 mg/kg) at locations on and near the former Irving Avenue Dump. Subsequent analysis of soil samples using the toxicity characteristic leaching procedure (TCLP) did not indicate the potential for excavated soil on the Project to be a RCRA Subtitle C (hazardous) waste, and so additional stabilization of excavated soil is not anticipated prior to disposal at a local RCRA Subtitle D (non-hazardous waste) landfill. However, due to the history of this area, that assumption may need to be confirmed with further testing of soil excavated as part of the Project, if requested by the landfill accepting the contaminated soil.

- Arsenic concentrations exceeded the MPCA Residential SRV (9 mg/kg) and/or Soil Leaching Value (SLV) (5.8 mg/kg) in all three reaches; however, these results are in the range of background soil concentrations commonly identified in fill soil (Barr, 2016a)
- B(a)P equivalent concentrations were above the MPCA Residential SRV (2.0 mg/kg) and SLV (1.4 mg/kg) in Reach 2, where asphalt pieces were observed.
- Mercury was detected at concentrations above the MPCA Residential SRV (0.5 mg/kg) in Reach 2 and the Industrial SRV (1.5 mg/kg) in Reach 3.
- DRO results were above the MPCA unregulated fill screening criteria of 100 mg/kg in all three reaches. All samples with DRO concentrations above criteria were collected from areas that also had debris or other chemical impacts.
- Remedial excavation was conducted at the Chemical Marketing site (Reach 3) to address chlorinated solvent impacts in the soil and groundwater. VOC concentrations above industrial soil criteria remain at the base of the excavation and were detected in surface soils during the Phase II Investigation.
- Excavations were conducted on the Scrap Metal Processors site (Reach 3) both within the creek overflow channel (alignment for the old tunnel) for a stormwater project work, and adjacent to the channel for remediation purposes. Impacted soil remains in place along the overflow channel.
- Asbestos containing material (ACM) was positively identified on the Irving Avenue Dump site (Reach 3). Additional ACM may be present in dump material or debris on the site.
- Larger debris is periodically present in the creek bed, and debris in fill soil has been observed in nearly all the soil borings completed along the creek, except for the western bank of Reach 1.

## 2.2 Description of Project Work

A Feasibility Study was prepared for the BCWMC, which evaluated creek erosion repair alternatives and identified preferred stabilization techniques for each targeted creek Site (Barr, 2016b). The recommended stabilization techniques include grading, stabilizing, and vegetating stream banks and installing rip rap, boulder and log vanes, vegetated reinforced slope stabilization, and willow stakes and live fascines. These techniques are shown for each Site on Figures 4 through 6 and are described in greater detail in Section 4.



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## 3.0 Response Action Objectives

The limited response actions for the Project are designed to appropriately manage the existing impacted soils and debris that will be excavated during the creek stabilization/improvement Project. The Project will also establish and improve ground cover at the stabilization areas which will result in minimizing future direct-contact exposure to creek bank soils. This approach has been developed in consideration of the following:

- The creek bank erosion repair and stabilization Project is intended to reduce sediment loading and associated nutrient and contaminant loading to Bassett Creek and prevent future channel erosion by stabilizing the creek banks, which will result in water quality improvements in the creek. The work will target sites in the Project area in need of repair or stabilization. Work will not extend along the entire length of each reach, nor will excavation occur to depths beyond what is needed to complete the repair and stabilization work.
- The pre-existing environmental issues present in the Project area extend well beyond the City easements and Project area. This RAP is focused on managing soils that require excavation in order to conduct the erosion repair work within the Project area.
- Soil investigation results from 2016 indicate the presence of debris at many sites, along with occasional constituents exceeding the requirements of MPCA's Unregulated Fill policy (see Figure 3). Soil exported from the Project will require landfill disposal, except for soil located on Reach 1 parkland, where soil samples meet MPCA requirements for Unregulated Fill. In most cases, the existing soils meet criteria for the land use for each site, industrial or recreational:
  - Soil results in the Project area were all below MPCA Industrial SRVs, except for one mercury result from a sample collected near Site 12. At Site 12 and other sites where excess soil is expected to be generated by the Project, the soil does not meet MPCA Residential SRVs and therefore cannot be reused as unregulated fill off site and will be disposed of at a landfill.
  - Soil samples collected on Reach 1 parkland in Bassett's Creek Park on the west side of the creek meet MPCA Recreational (and Residential) SRVs.
- Land use and ownership will not be changed as a result of Project implementation. Land use adjacent to all three reaches is a mixture of industrial and recreational (parkland). Active or abandoned industrial facilities are present along all three reaches.
- There is limited accessibility to the creek in the Project area, with fencing, dense vegetation, and steep banks restricting access across most of the Project area and limiting direct exposure to the soil on the creek banks. Because of the conditions, the visitors to the creek are typically adults traveling along the creek for short durations, rather than individuals regularly climbing on the steep banks, limiting direct contact exposure concerns for the current land use. Soils along the

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portion of the Project area with an accessible walking path adjacent to the creek meet MPCA Recreational soil criteria. Mitigating direct contact exposure to all soils along the creek is not an objective of this RAP, but some of the erosion repair work will provide improved cover along portions of the creek banks.

- Groundwater response actions are not included as part of this RAP, because groundwater will not be managed as part of the Project (i.e., no excavation dewatering) and there are groundwater impacts throughout the neighboring area associated with sources that lie beyond Project area.

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## 4.0 Response Action Plan

Based on the documented site conditions, most of the soil in the Project area will have impacts such as debris, arsenic, mercury, lead, polycyclic aromatic hydrocarbons (PAHs), and DRO. Because of the impacts, soil exported from the Project will likely be unsuitable to reuse offsite as Unregulated Fill (MPCA, 2012) and exported soil will require landfill disposal. Response actions are developed to manage the soil that will be exported as part of the creek erosion repair and stabilization Project. The following sections provide a description of the planned response actions.

### 4.1 Response Actions

Creek bank stabilization and erosion repair work is planned at fifteen Sites along the creek as shown on Figures 4 through 6, most of which are expected to require management of contaminated soils and/or debris. The creek bank stabilization options that involve contaminated soil management include stream bank grading and excavation to install rip rap, vegetated reinforced soil stabilization, boulder and log vanes, and plantings along the creek banks.

#### 4.1.1 Environmental Oversight and Sampling

Soil management for excavated materials will include field screening for evidence of environmental impacts. Soil from the excavations will be inspected for visual evidence of contamination (i.e. incidental odor, discoloration, and sheen) and monitored for the presence of volatile organic vapors, in accordance with Barr's standard operating procedures (SOPs). A photoionization detector equipped with a 10.6 eV lamp will be used for headspace screening. Soils will be classified in general accordance with American Standard Testing Methods (ASTM) D2488 by Barr field staff.

Due to extensive documentation of the soil contamination (see Figures 2 and 3) and the establishment of cover over the left-in-place soils, no confirmation or documentation samples will be collected from areas of grading or excavation. Samples will be collected for landfill characterization for off-site disposal, as required by the landfill.

Environmental oversight and field screening will be planned at each site involving excavation of soil, and as needed based on the Project schedule and activities at each Site. At Sites in the vicinity of historical documentation of lead impacts, including Sites 9, 11 and 13, collection of soil samples for TCLP lead analysis may be conducted if used battery casings fragments are observed or if required by the landfill. If hazardous levels of lead are identified based on TCLP results above 5 mg/L, the soil will require stabilization as outlined in the Contingency Plan (Appendix A). Lead contaminated soil will be stabilized through mixing with a stabilization reagent using standard construction equipment.

#### 4.1.2 Excavated Soil Management

Limited soil excavation will be conducted to reduce the creek embankment slopes and facilitate placement of engineered fill and bank stabilization features along the creek banks. This will result in more stable creek banks and minimize sloughing of side slopes into the creek bed. The planned stabilization techniques and areas of soil excavation are shown on Figures 4 through 6. Stabilization techniques

requiring soil management are depicted in cross sections on Figure 7 and are discussed in more detail below.

Due to the presence of contamination and/or debris fill, the excess soils removed from portions of the Project area cannot be reused off-site. It is anticipated that stabilization techniques utilized at the following Sites will result in excess soil: Sites 2, 4, 5, 6, 7, 8, 9, 12 and 13. Excess soil from all Sites except those on the western bank of Reach 1 (Sites 1, 3 and 5) will be disposed of at a permitted landfill facility. Preliminary estimates indicate approximately 1,200 to 1,500 CY of impacted soil is anticipated to be excavated and disposed offsite as part of the stabilization Project.

Creek bed soils/sediment will be removed only to the extent necessary to install the rip rap and boulder/log vanes. Minimal incursions into the bed at the creek bank will be necessary to toe the riprap and vanes into the bank for stability. The excavated creek bed soils, if free of debris, may be redistributed in the work area, within the Site in which they originated. If redistribution is not feasible, the excavated materials will be disposed of at a permitted landfill facility.

The excavation work will also include gathering larger debris that are present in the creek and along the bank (e.g., tires, concrete, woody debris, junk, etc.) The gathered large debris will also be disposed at an off-site landfill.

#### **4.1.3 Soil Stockpiling, Loading and Transport**

Debris fill and impacted soil will be direct loaded into haul trucks when feasible. If direct loading is not feasible, soil will be transported by earthwork equipment along the creek for loading at the nearest access out of the creek. Some temporary stockpiling of materials may be necessary at the excavation areas.

All soil materials to be disposed at a landfill facility will be covered during transit, managed under waste manifests provided by the landfill, and quantified with weigh tickets. Reuse of soils at offsite properties is not anticipated.

#### **4.1.4 Creek Improvements**

Following the planned excavations for stream bank stabilization, a clean cover will be established over remaining impacted soil and debris in the Project work areas. The Project will reduce direct contact exposure to impacted soil left in place with top soil and erosion control fabrics, improved vegetation, placement of rip rap and other ground cover improvements. As noted previously, Phase II investigation results indicate soils along the creek meet the MPCA criteria for the current land use except near Site 12. Figure 7 shows conceptual cross sections of anticipated areas of soil removal, soil disturbance and future conditions after the placement of stabilization techniques and covers in Project areas.

#### ***Excavation, Grading and Fill Removal***

Some creek banks will require fill removal to improve the slope of the bank and correct banks undercut by erosion, or to install stabilization measures. Sites where fill removal and subsequent landfill disposal of excess soil is anticipated are shown in cross section on Figure 7.

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### ***Boulder and Log Vanes***

Boulders or large logs will be buried in the stream bed and extend partially or entirely across the stream to achieve one or more of the following goals: re-direct flows away from banks, encourage sediment deposition in selected areas, control stream bed elevations, and create scour pool habitat features. This technique will be used at Sites 7 and 12 (Figure 7, Section 5). Soil will be removed and replaced during construction to the extent possible.

### ***Vegetation – Live fascines and stakes, vegetated buffer and ground cover***

Live cuttings of re-sprouting woody species such as willow and dogwood will be installed in bundles (fascines) or inserted into stream banks (stakes) to stabilize bare soils and increase resistance to fluvial erosion. The fascines and stakes will result in a stand of thick-growing willows along the bank, providing an improved soil cover and reducing access. Additionally, vegetated buffers and ground covers will be established to stabilize bare soils, increase resistance to fluvial erosion, and provide a clean cover over potentially impacted soils or debris left in place. This technique will be used at Sites 2, 9, 13, and 14. Vegetation is not expected to create excess soil that requires offsite disposal.

### ***Rip Rap***

Rip rap will be used for creek bank stabilization and toe protection to protect the slope and toe of the bank from erosion, and to prevent undercutting and slumping. The application of rip rap will provide a cover over potentially impacted soil or debris left in place. This technique will be used at Sites 3, 4, 5, 6, 10, 11, and 12. Soil generated from the installation of rip rap will be regraded around the installation site.

### ***Vegetative Reinforced Slope Stabilization (VRSS)***

The VRSS includes alternating intervals of engineered fill and geotextile fabric to stabilize the creek bank. The VRSS is composed of soil lifts created with long-lasting but biodegradable fabric, which is vegetated to stabilize steep slopes and encourage establishment of root systems for further stabilization. The VRSS fabric and vegetation will provide an improved cover over the in-place soil. This technique will be used at Sites 5 and 6. The creek banks at Site 6 require significant fill removal to reduce the steep slope prior to installing VRSS, and landfill disposal of the excess soil will be required. Soil at Site 5 is not impacted, so excess soil removed may be reused onsite or off-site.

### ***Topsoil and Vegetation***

In top slope areas where debris fill is exposed, a ground cover consisting of a minimum of 6-inches of topsoil will be established and the area will be seeded to establish vegetation. The topsoil cover will be established in a manner consistent with the grades of adjacent areas so that the drainage patterns are preserved. If over-excavation is required to establish a topsoil cover at impacted Sites, the excavated soil/debris will be managed with other soil/debris for off-site disposal.

In areas where the existing topsoil is disturbed during Project implementation, but no excavation or grading is conducted, and visual reconnaissance has not identified debris, vegetative cover will be reestablished via seeding. If the soil disturbance results in exposing debris fill, the shallow debris fill will either be covered or removed to a depth of 6 inches and then covered. Excavated debris fill will be

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managed and disposed off-site and the debris cover will involve placement of 6 inches of topsoil cover as described above.

#### **4.1.5 Import Material**

The majority of the creek stabilization work involves either import of materials to stabilize the creek banks, which includes some topsoil, boulders, VRSS materials and plantings. Excavation of excess soil will primarily be performed to cut back steep creek banks, so significant volumes of backfill are not expected to be needed. However, some imported topsoil is anticipated to be needed to provide improved soil quality for plantings. Import material quantities and types will be determined during the design for the creek improvement Project.

If topsoil import is needed, the soil will be sampled at the source prior to importing to the site. Import soil samples will be field screened and analyzed for PAHs and RCRA metals, DRO and GRO and compared to criteria for Unregulated Fill (MPCA, 2012). One soil sample will be collected per approximately 1,000 cubic yards of soil imported, up to a maximum of two analytical samples per source. Soil imported to the site will be periodically field screened (visually, olfactory, and soil vapor headspace analysis) by the Environmental Representative.

### **4.2 Additional Tasks**

The following tasks will be conducted to support the implementation of the planned response actions.

#### **4.2.1 Health and Safety**

A Project Health and Safety Plan (PHASP) will be prepared for use during the implementation of the response actions. The PHASP will describe the level of required personal protective equipment (PPE) required for oversight of the construction activities, procedures and frequency for air monitoring, and exposure hazards for the COCs. The selected contractor will develop a PHASP, or adopt the Barr PHASP, for use by the contractor's construction crew. The construction crew will be 40-hour HAZWOPER trained.

#### **4.2.2 Contingency Plan**

As with all construction projects, it is possible that unexpected environmental conditions may be encountered during the work. In the event that unexpected environmental conditions are encountered, the MPCA will be notified and a course of action consistent with the purposes of the Project, this RAP and the Site Contingency Plan will be presented. A framework describing how unexpected environmental conditions will be handled and discussion of commonly contingency action scenarios is presented in the Site Contingency Plan in Appendix A.

All contingent actions will be documented in the RAP Implementation Report.

#### **4.2.3 Permits**

It is anticipated that additional permits and considerations that the Project will require include the following: 1) a Clean Water Act Section 404 Permit from the USCAE, or Letter of Permission under a General permit, and Section 401 certification from the MPCA, 2) compliance with the Minnesota Wetland

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Conservation Act, 3) a Construction Stormwater General Permit from the MPCA and a Construction Stormwater Pollution Prevention Plan (SWPP), 4) a Public Waters Work Permit from the MDNR, 6) an Erosion and Sediment Control Plan approved by the City of Minneapolis, and 7) a Construction Permit for work on Minnesota Park and Recreation Board (MPRB) land. Procurement of these permits, which will occur prior to construction activities, will be documented in the Implementation Report.

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## 5.0 Reporting and Schedule

The implementation of the response actions described in this RAP will be observed and documented during construction activities by an environmental professional. Documentation will include field reports documenting the contractor activities, soil volumes, engineering controls, discovered unforeseen field conditions, soil observation and screening results, identified problems and corrective actions, plan modifications, changes in Project scope, and photographs.

A RAP Implementation Report (Implementation Report) will be prepared upon completion of the Project and submitted to the VIC staff. The Implementation Report will include documentation of construction activities and figures showing the locations of excavation, soil removal, soil backfilling, and soil cover placement. The Implementation Report will be prepared with sufficient detail to document the work and demonstrate compliance with this RAP. Technical review of the RAP is being sought from the MPCA; other liability assurances are not anticipated to be requested by the City or BCWMC.

The anticipated Project schedule, including requested MPCA involvement, is provided below:

<b>Task</b>	<b>Approximate Schedule</b>
Submittal of RAP to MPCA	September 1, 2016
MPCA Technical Review and Approval of Updated RAP	September - October 2016
Potentially Seek Brownfield Grant Funding	November 1, 2016
Finalize Design of Creek Restoration Project and Public Bidding	2017
Project Implementation	Winter 2017-2018
RAP Implementation Report Submittal to MPCA	Spring 2018



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## 6.0 References

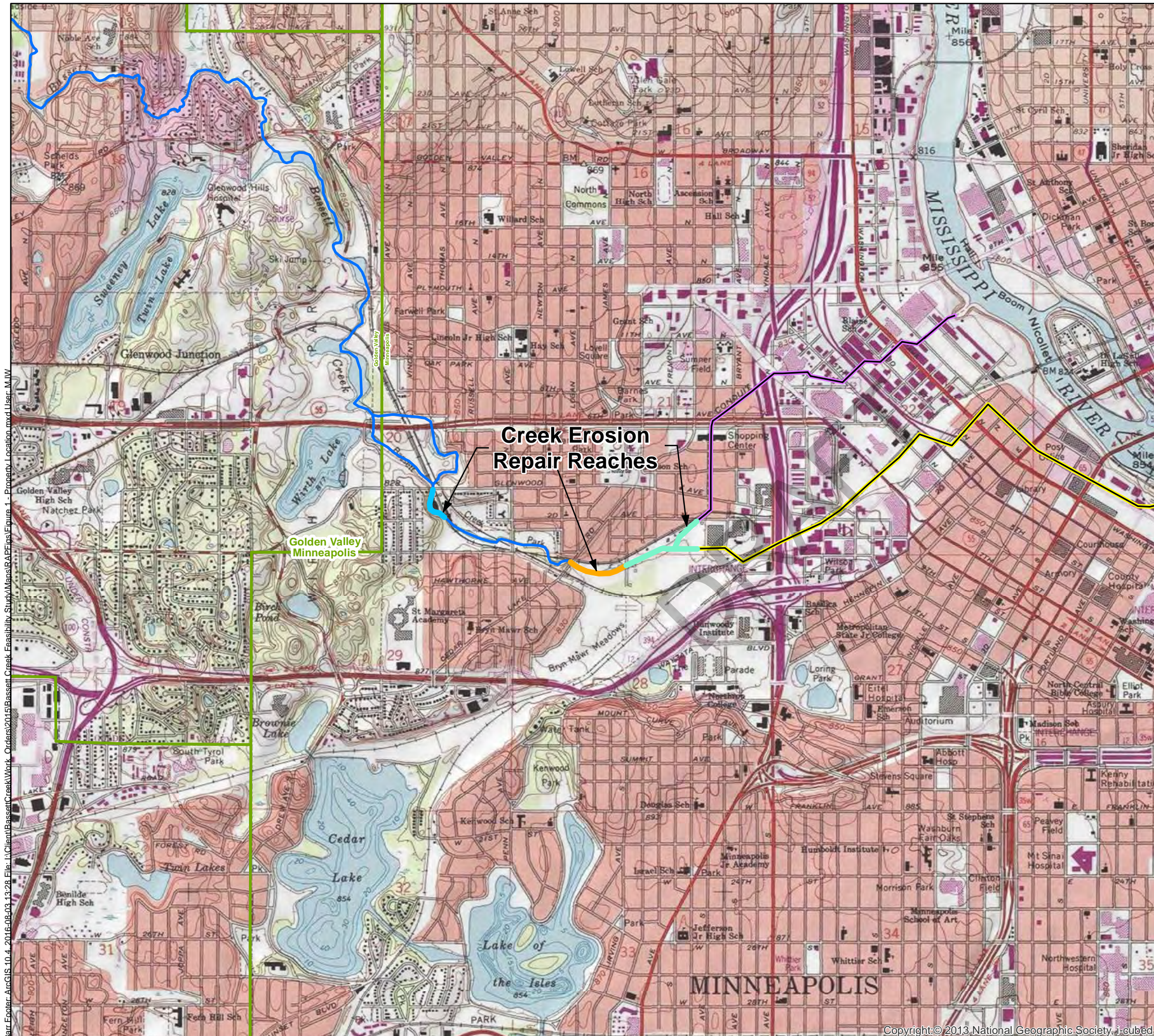
- Barr, 2015a. Phase I Environmental Site Assessment, Bassett Creek Main Stem Erosion Repair Project. Bassett Creek from Cedar Lake Road to Dupont Avenue N/2<sup>nd</sup> Avenue N, plus Fruen Mill Site, Minneapolis, Minnesota. December, 2015.
- Barr, 2015b. Phase II Investigation Work Plan, Bassett Creek Main Stem Erosion Repair Project, Minneapolis, Minnesota. December, 2015.
- Barr, 2016a. Phase II Investigation Report, Bassett Creek Main Stem Erosion Repair Project, Minneapolis, Minnesota. April, 2016.
- Barr, 2016b. Feasibility Report for the Bassett Creek Main Stem Erosion Repair Project, Minneapolis Minnesota. April, 2016.
- MPCA, 2012. Best Management Practices for the Off-Site Reuse of Unregulated Fill.

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Figures

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- Fruen Mill (Reach 1)
- Cedar Lake Rd to Irving Ave (Reach 2)
- Irving Ave to Dupont/2nd Ave (Reach 3)
- Stream
- Old Tunnel
- New Tunnel

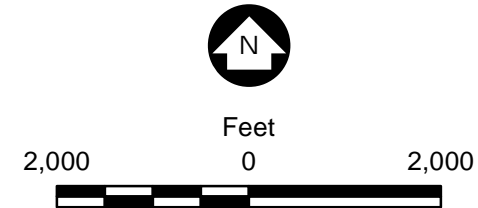
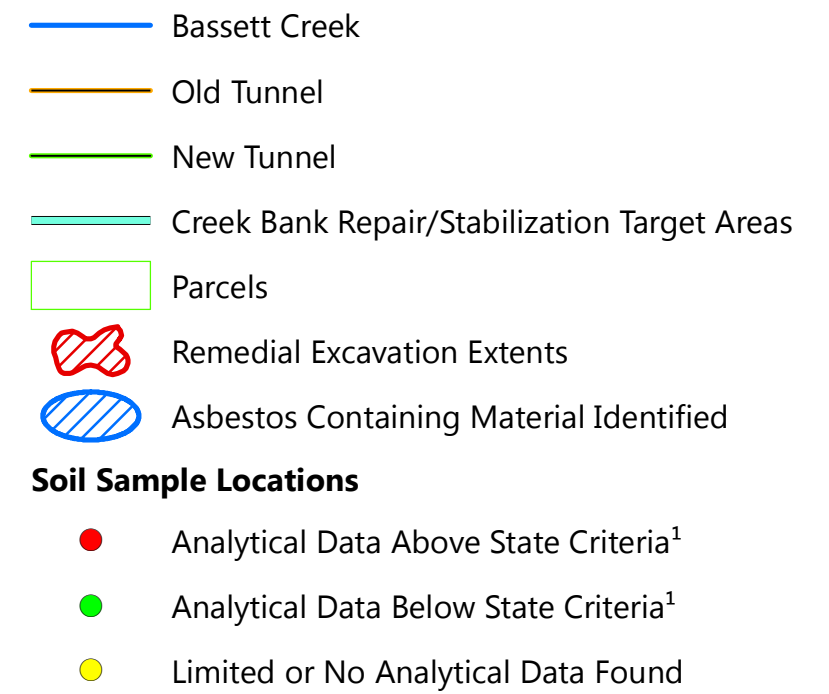
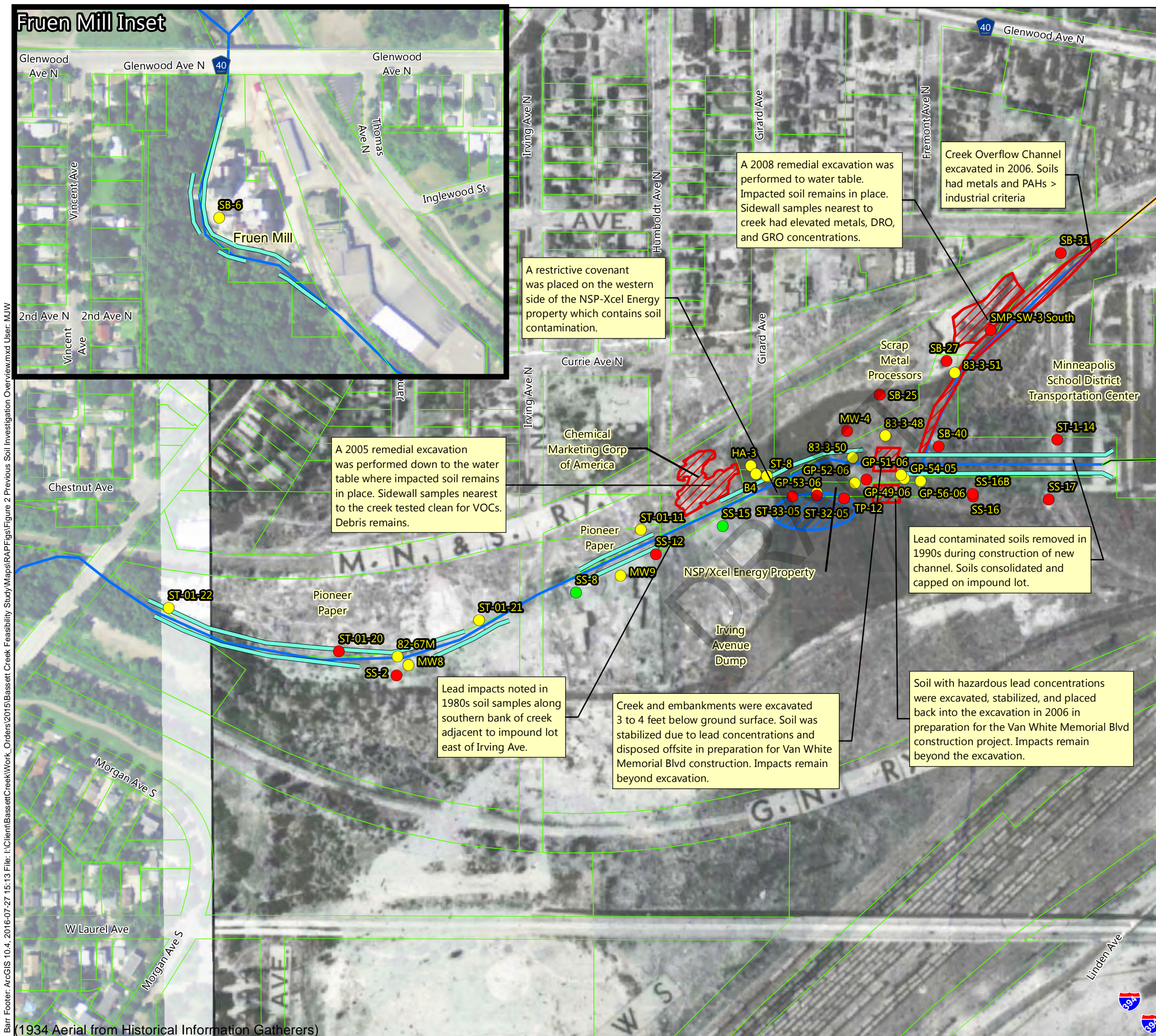


Figure 1

PROJECT LOCATION  
 Bassett Creek Main Stem Erosion Repair Project  
 Bassett Creek Watershed  
 Management Commission  
 Minneapolis, Minnesota





**Notes:**

1. Minnesota soil criteria as of reported date.
2. Table 1 shows analytes tested at each sample location
3. Sample locations below Van White Memorial Blvd. and within remedial excavation extents are not shown
4. Debris encountered in majority of soil borings shown.
5. Soil sample locations within approximately 50 feet of creek are shown.
6. Asbestos containing material may be present throughout dump material. Area shown is where samples were tested.

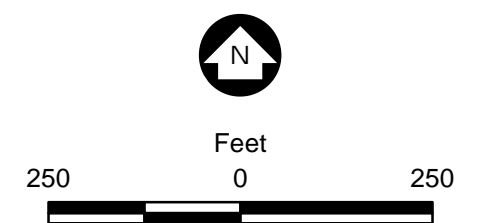
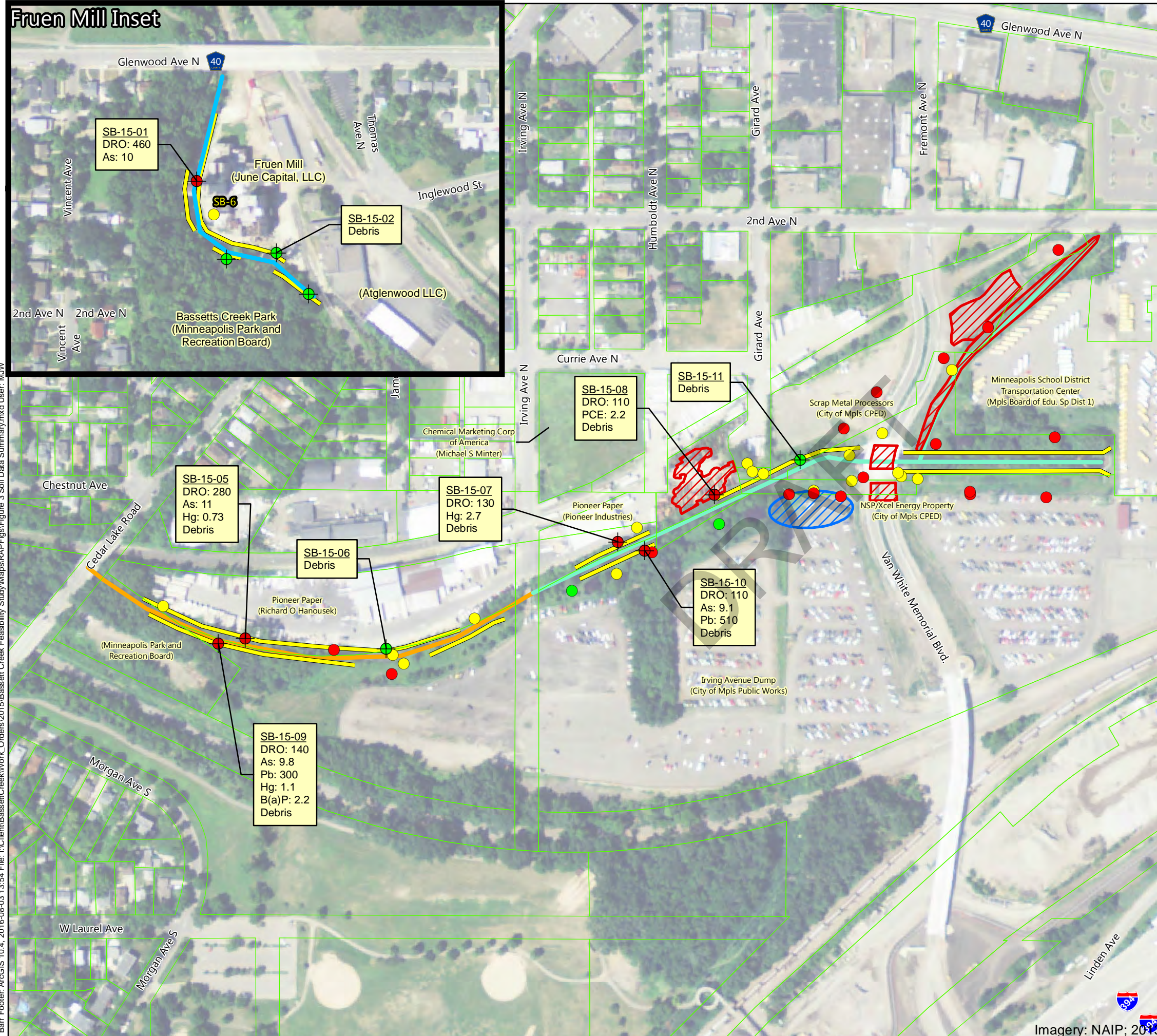


Figure 2

HISTORICAL SOIL INVESTIGATION OVERVIEW  
 Bassett Creek Main Stem Erosion Repair Project  
 Bassett Creek Watershed  
 Management Commission  
 Minneapolis, Minnesota





- Fruen Mill (Reach 1)
- Cedar Lake Rd to Irving Ave (Reach 2)
- Irving Ave to Dupont/2nd Ave (Reach 3)
- Stabilization Target Areas
- Property Boundary
- SITE NAME  
(PROPERTY OWNER FROM HENNEPIN COUNTY  
PROPERTY INFORMATION SEARCH)
- Remedial Excavation Extents
- Asbestos Containing Material Identified
- Historical Soil Sample Locations
  - Analytical Data Above State Criteria<sup>1</sup>
  - Analytical Data Below State Criteria<sup>1</sup>
  - No Analytical Data Found
- 2016 Soil Sample Locations
  - Analytical Data Above MPCA Criteria for Unregulated Fill.
  - Analytical Data Below MPCA Criteria for Unregulated Fill.

- Notes:
1. Minnesota soil criteria as of reported date.
  2. Debris encountered in majority of historical soil borings shown.
  3. Asbestos containing material may be present throughout dump material. Area shown is where samples were tested.
  4. Soil analytical data provided in mg/kg.

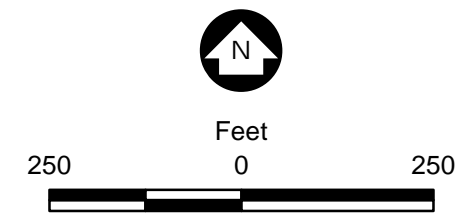


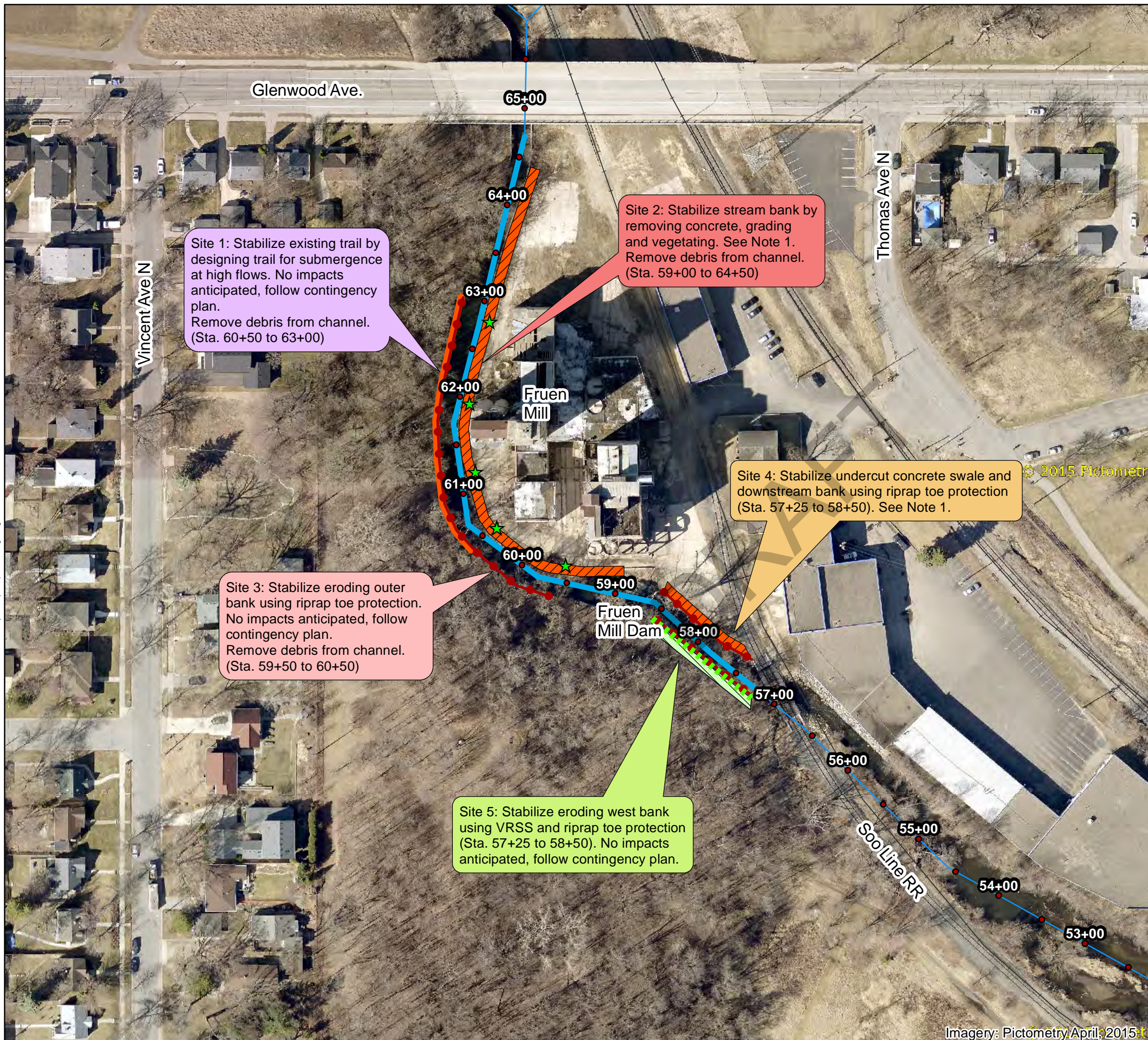
Figure 3

2016 PHASE II SOIL INVESTIGATION SUMMARY  
 Bassett Creek Main Stem Erosion Repair Project  
 Bassett Creek Watershed  
 Management Commission  
 Minneapolis, Minnesota

Barr Footer: ArcGIS 10.4, 2016-08-03 13:54 File: I:\Client\BassettCreek\Work\_Orders\2015\BassettCreek\_Feasibility\_Study\Maps\RAP\Figs\Figure 3 Soil Data Summary.mxd User: MJW

Imagery: NAIP; 2013



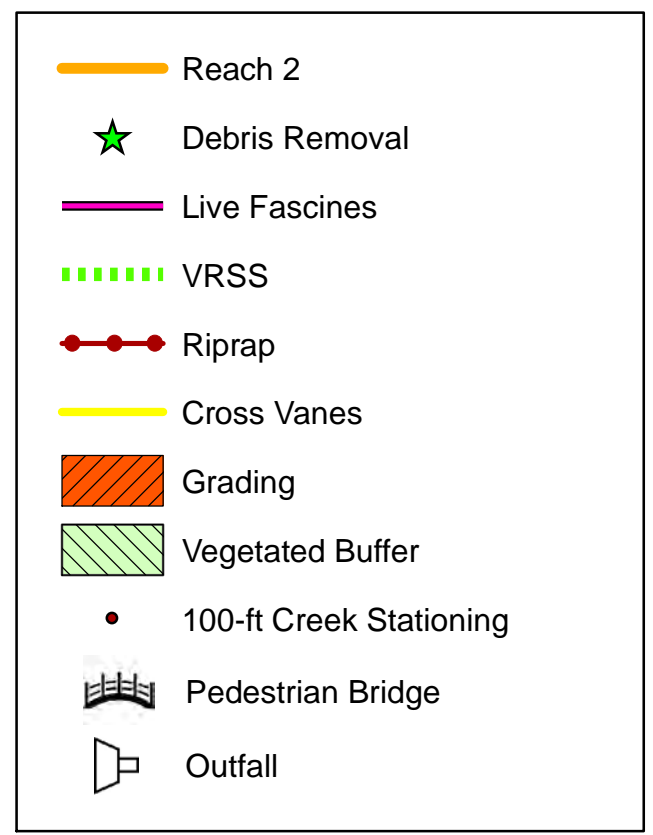
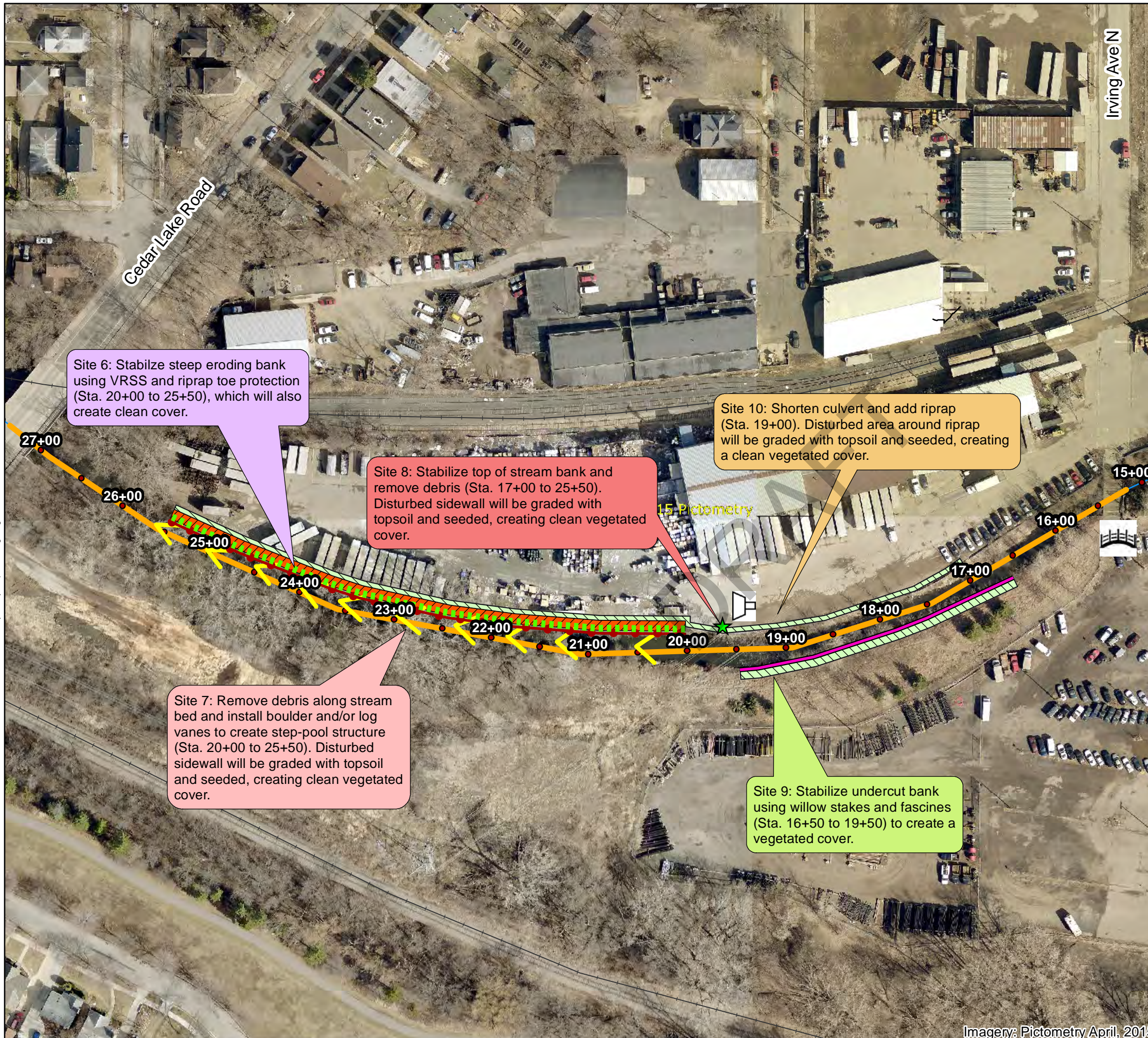


**Figure 4**

**REACH 1 STABILIZATION SITES**  
 Bassett Creek Main Stem Erosion Repair Project  
 Bassett Creek Watershed Management Commission  
 Minneapolis, Minnesota



Barr Footer: ArcGIS 10.4, 2016-07-27 15:21 File: I:\Client\BassettCreek\Work\_Orders\2015\Bassett\_Creek\_Feasibility\_Study\Maps\RAP\Figs\Figure 5 Reach 2 Recommended Alts.mxd User: M.J.W



Note: Soil removals from Reach 2 are assumed to require landfill disposal.

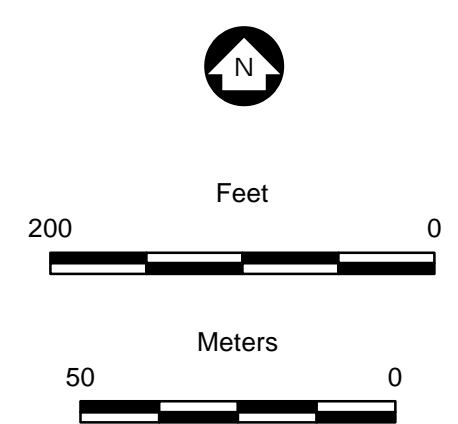
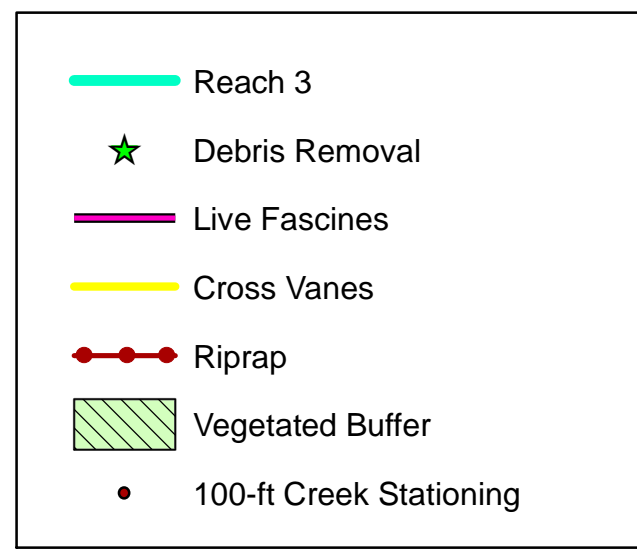
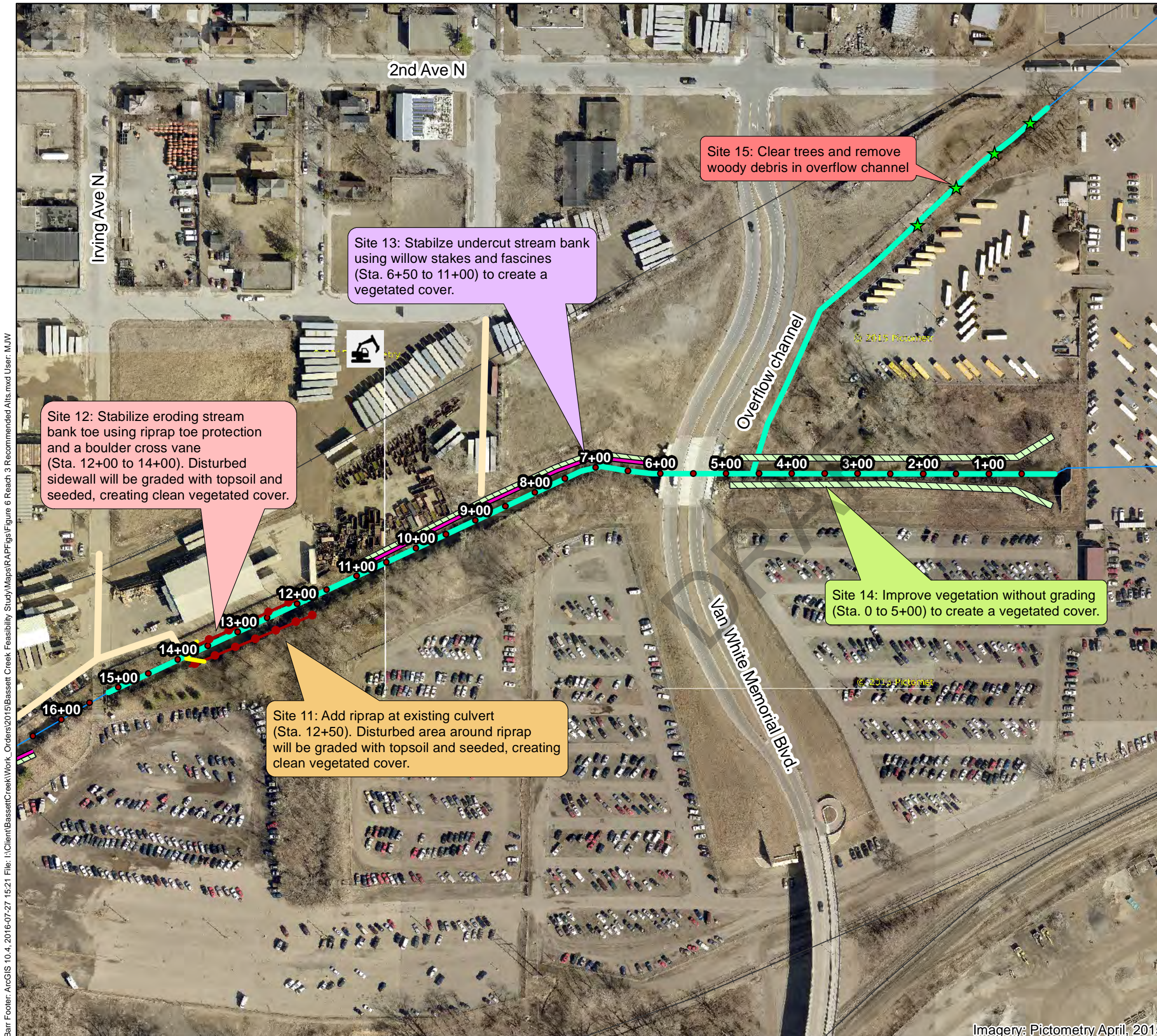


FIGURE 5

REACH 2 STABILIZATION SITES  
 Bassett Creek Main Stem Erosion Repair Project  
 Bassett Creek Watershed Management Commission  
 Minneapolis, Minnesota

Imagery: Pictometry April, 2015





Note: Soil removals from Reach 3 are assumed to require landfill disposal and may require stabilization prior to disposal.

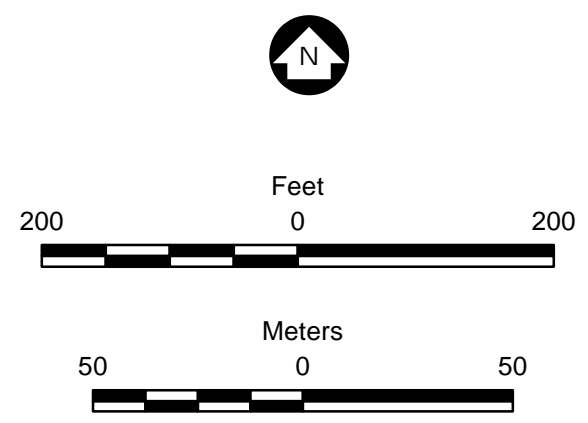
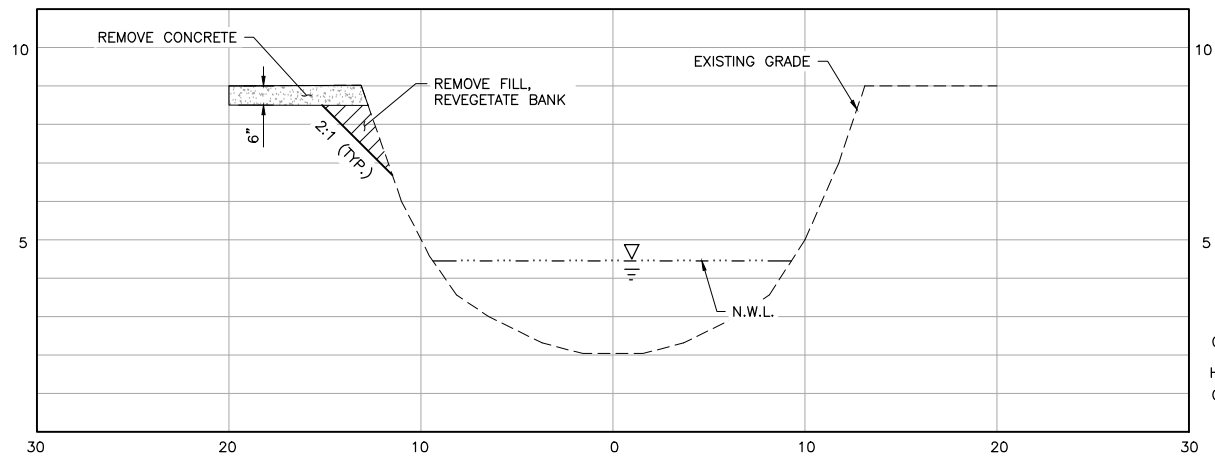


FIGURE 6  
 REACH 3 STABILIZATION SITES  
 Bassett Creek Watershed  
 Management Commission  
 Minneapolis, Minnesota

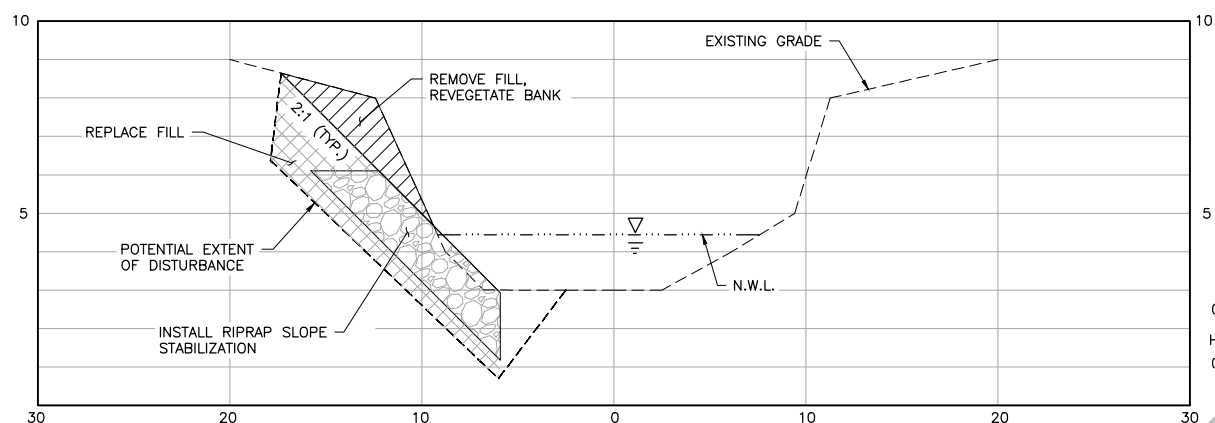
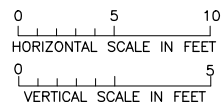
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Imagery: Pictometry April, 2015

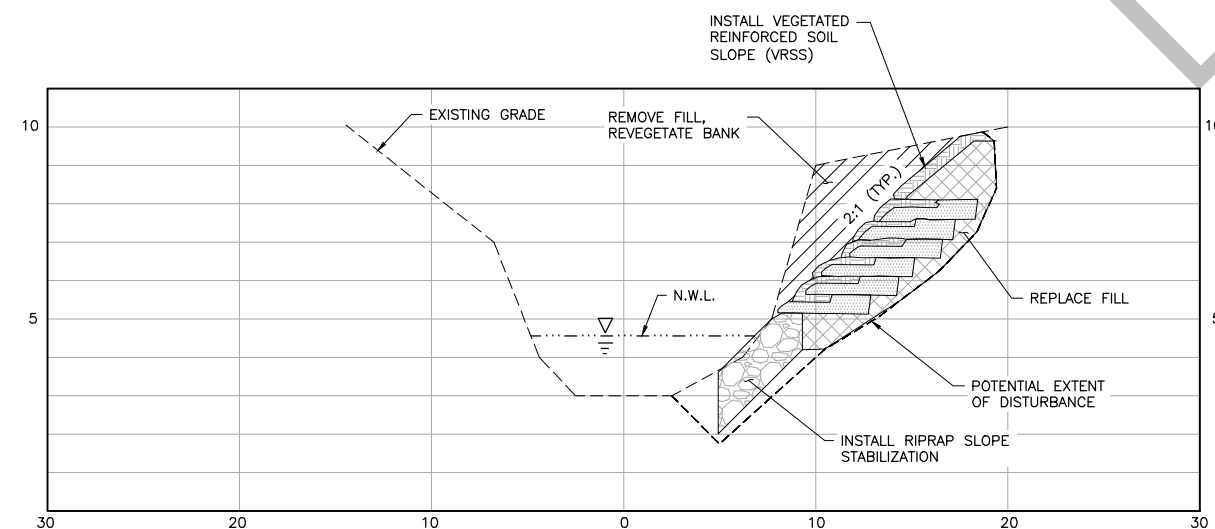
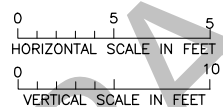




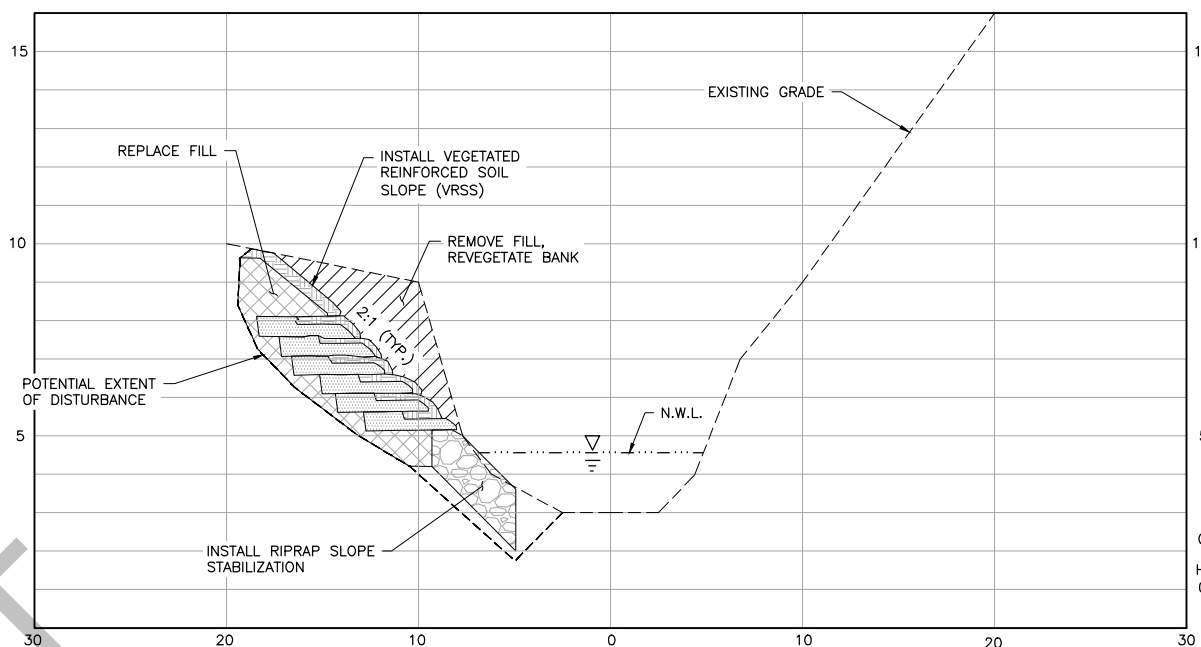
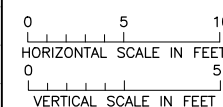
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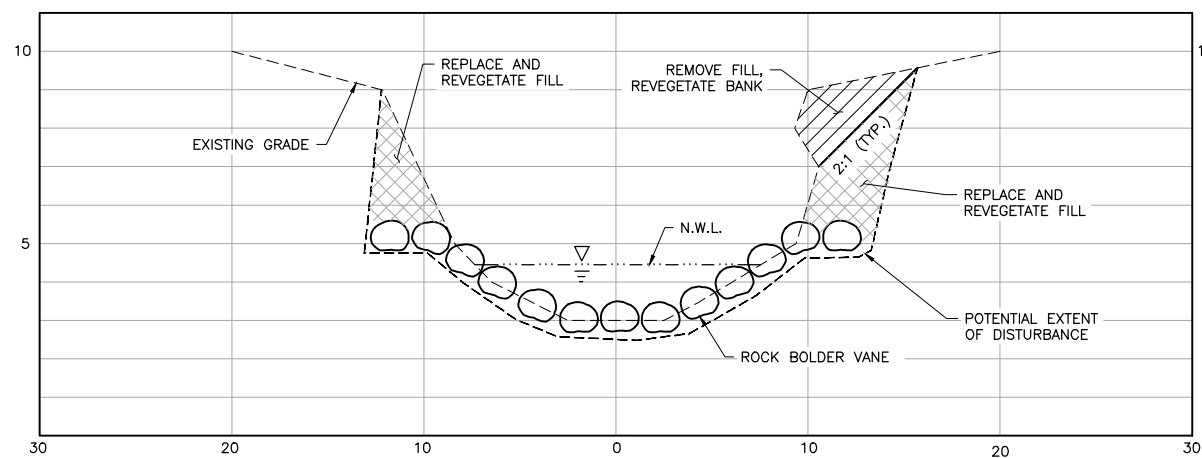
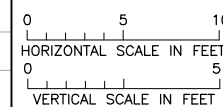
2 SECTION: BASSETT CREEK (SITES 3 & 4)



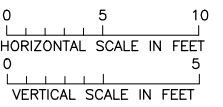
3 SECTION: BASSETT CREEK (SITE 5)



4 SECTION: BASSETT CREEK (SITE 6)



5 SECTION: BASSETT CREEK (SITES 7 & 12)



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NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINTED NAME: \_\_\_\_\_  
SIGNATURE: \_\_\_\_\_  
DATE: \_\_\_\_\_ LICENSE # \_\_\_\_\_

CLIENT	BID	CONSTRUCTION	RELEASED TO/FOR	A	B	C	0	1	2	3

**BARR** ENGINEERING CO.  
4300 MARKETPOINTE DRIVE  
Suite 200  
MINNEAPOLIS, MN 55435  
Ph: 1-800-632-2277  
Fax: (952) 832-2601  
www.barr.com

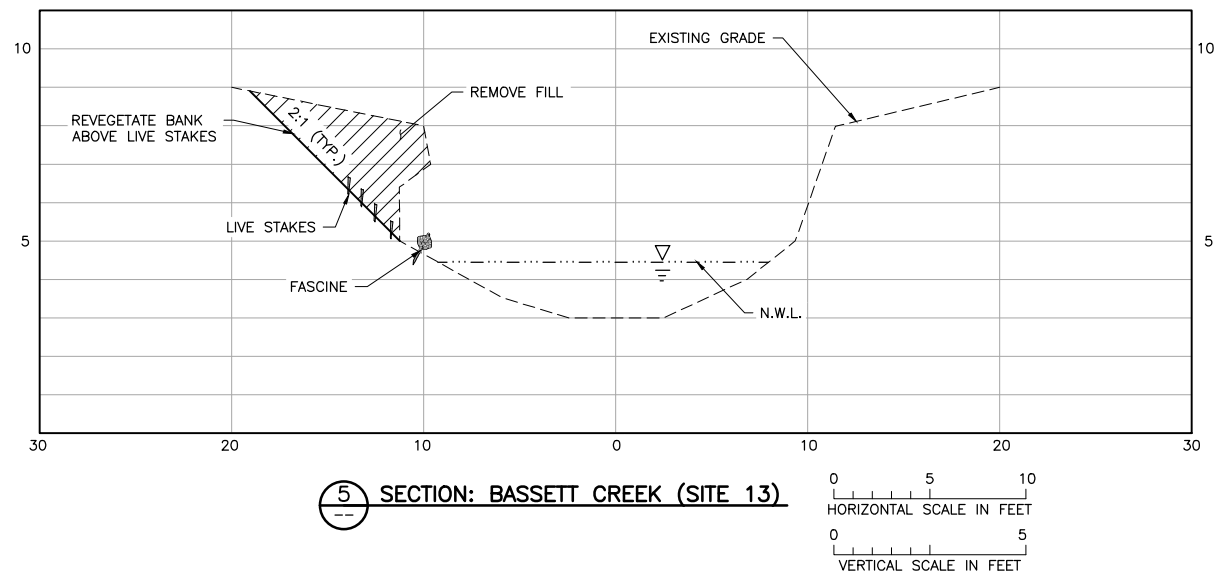
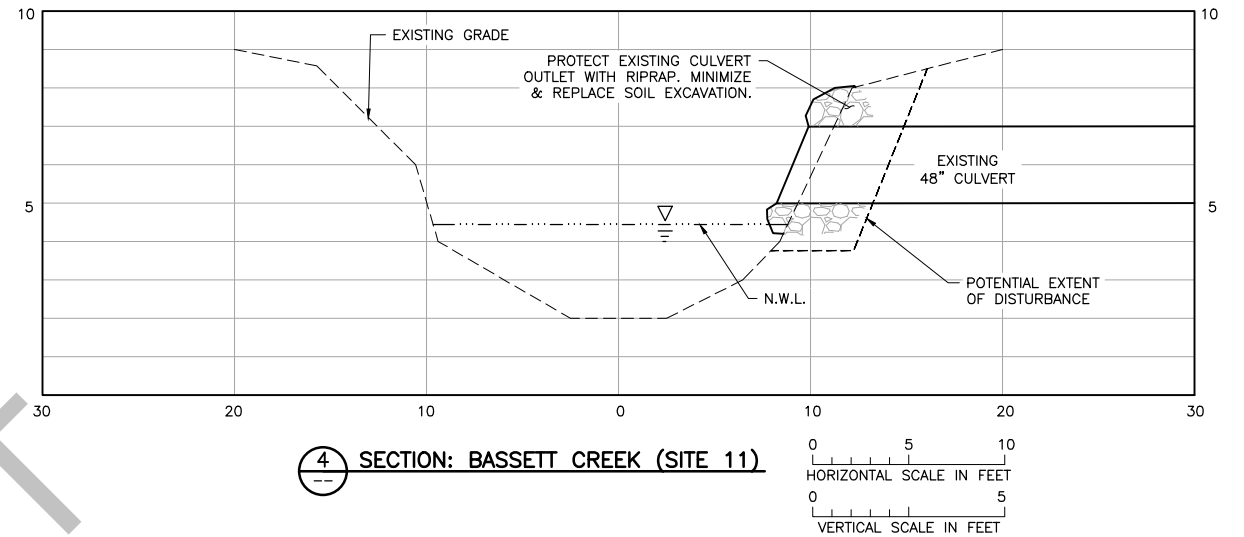
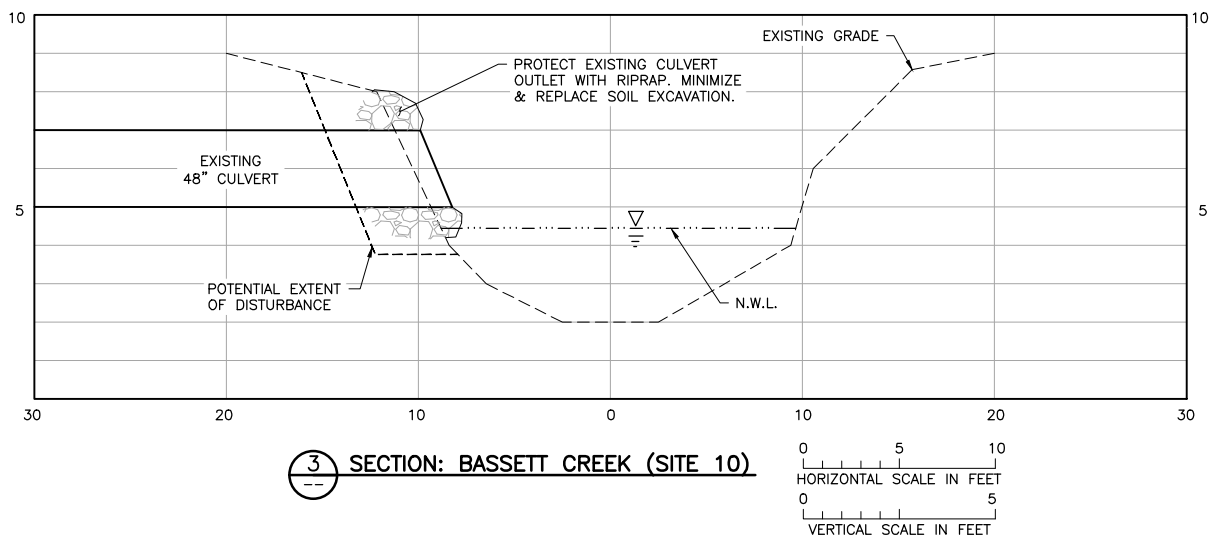
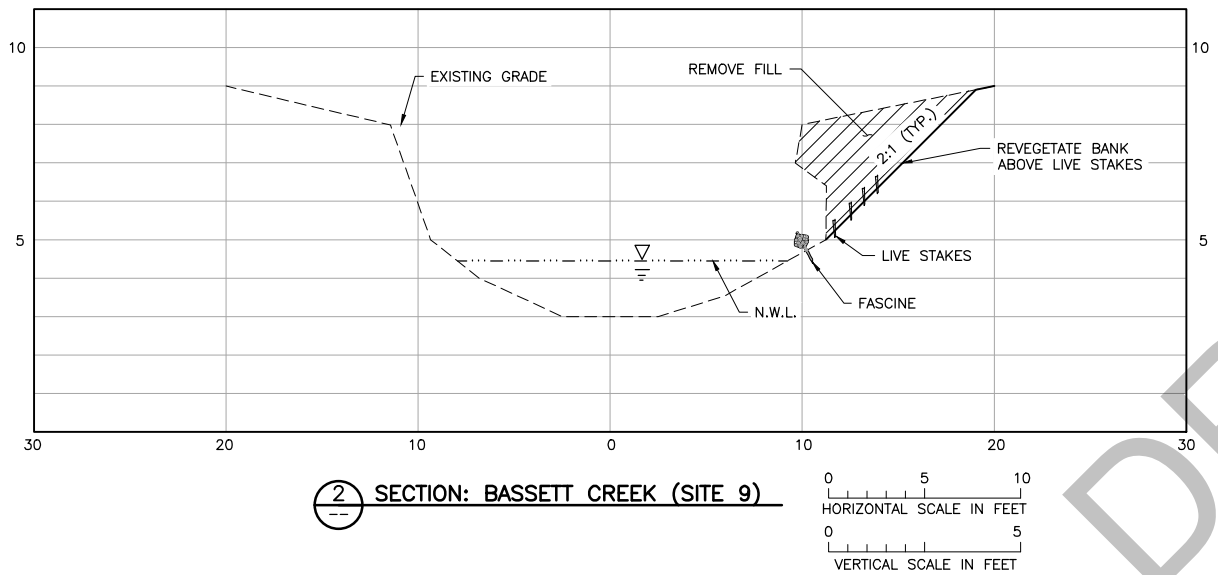
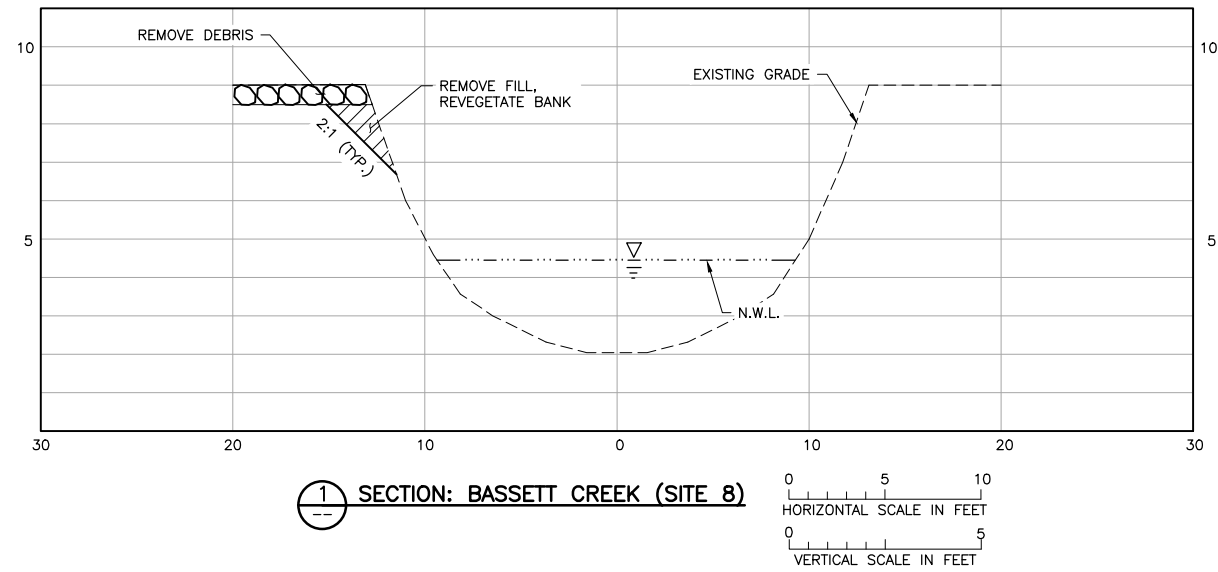
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Date	07/25/2016
Drawn	EPF
Checked	JDW
Designed	
Approved	

FIGURE 7  
CONCEPTUAL STABILIZATION TECHNIQUES

BCWMC  
MINNEAPOLIS, MN.

BARR PROJECT No.	23/27-1516.00
CLIENT PROJECT No.	
DWG. No.	1
REV. No.	0

CADD USER: Eric P. Fitzgerald FILE: M:\DESIGN\23271516.00\CAD\23271516\_BASE\_MAP.DWG PLOT SCALE: 1:2 PLOT DATE: 8/10/2016 9:06 AM  
 BARR MA AutoCAD 2011 Support\enu\Template\Barr\_2011\_Template.dwt Plot at 1 10/05/2010 14:03:50



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PRELIMINARY  
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				I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA. PRINTED NAME: _____ SIGNATURE: _____ DATE: _____ LICENSE # _____				CLIENT BID CONSTRUCTION				Project Office: <b>BARR ENGINEERING CO.</b> 4300 MARKETPOINTE DRIVE Suite 200 MINNEAPOLIS, MN 55435 Corporate Headquarters: Minneapolis, Minnesota Ph: 1-800-632-2277 Fax: (952) 832-2601 www.barr.com				Scale AS SHOWN Date 07/25/2016 Drawn EPF Checked JDW Designed Approved				<b>FIGURE 7</b> CONCEPTUAL STABILIZATION TECHNIQUES				<b>BCWMC</b> MINNEAPOLIS, MN.				BARR PROJECT No. <b>23/27-1516.00</b> CLIENT PROJECT No. DWG. No. <b>2</b> REV. No. <b>0</b>																																			
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Appendices

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## Appendix A

### Site Contingency Plan

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# Site Contingency Plan

## *Bassett Creek Main Stem Erosion Repair Project*

Prepared for

Bassett Creek Watershed Management Commission, the City of  
Minneapolis and Hennepin County Environment and Energy  
Department

August, 2016

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# Site Contingency Plan

## *Bassett Creek Main Stem Erosion Repair Project*

Prepared for

Bassett Creek Watershed Management Commission, the City of  
Minneapolis and Hennepin County Environment and Energy  
Department

August, 2016

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Bassett Creek Main Stem Erosion Repair Project  
Bassett Creek Watershed Management Commission

August 2016

Contents

Site Contingency Plan.....2

1.0 Introduction and Purpose .....2

2.0 Initial Actions.....3

3.0 Assessing the Situation .....3

4.0 Contingent Actions .....4

    4.1 Dissimilar Contaminated Soils (not a RCRA-regulated hazardous waste).....4

    4.2 RCRA-Regulated Hazardous Waste.....5

        4.2.1 Stabilization of Lead Contaminated Soils .....6

    4.3 Buried Drums or Containers .....6

    4.4 Underground Storage Tanks.....6

    4.5 Buried Debris Including Asbestos-Containing Waste Materials .....7

    4.6 Water Accumulation in the Excavation .....8

    4.7 Objects Such as Wells or Vent Pipes.....8

5.0 Documentation and Reporting .....8

# Site Contingency Plan

## *Bassett Creek Main Stem Erosion Repair Project, Minneapolis, Minnesota (PB PB4955/VP33640)*

### *Bassett Creek Watershed Management Commission*

#### *August 2016*

The Response Action Plan (RAP) for this project is based on existing site characterization data and the selected response action. A review of existing data and analytical results from Phase II investigation indicates that soil in the project area contains debris and concentrations of arsenic, mercury, lead, polycyclic aromatic hydrocarbons, volatile organic compounds, and diesel range organics above Minnesota soil criteria at the time the reports were prepared. The RAP includes excavation of contaminated soil in areas along the creek, to allow for construction of stabilization features as part of the erosion repair and creek bank stabilization project. Work under the RAP will be conducted under a project health and safety plan by a contractor with OSHA HAZWOPER trained personnel.

## 1.0 Introduction and Purpose

This Site Contingency Plan will be used if contamination is encountered during RAP implementation that is significantly different from previous site characterization data and from conditions that are addressed in the RAP.

During RAP implementation, the people involved need to be alert to the possibility that unexpected hazardous substances or petroleum products may be encountered. If unexpected hazardous substances or petroleum products are encountered during response actions, the parties onsite will need to make decisions on short notice. These decisions potentially have serious impacts and consequences. To help ensure that situations are handled properly, personnel involved in RAP-related activities must be trained in the immediate recognition of a wide range of potential hazards and be ready to respond in accordance with a previously prepared general plan of action. Such a plan is commonly referred to as a Site Contingency Plan.

This Site Contingency Plan is a stand-alone document. A copy will be available at the site during RAP implementation and individuals on site that are responsible for managing the RAP-related work will be provided with a copy and be familiar with its contents.

Unexpected contingent conditions that may be encountered could include uncovering an unknown underground storage tank, a water well or vent pipe, debris, containers, contaminated soils that are different than expected under the RAP, or water that accumulates in the excavation. These and other



unexpected conditions will be addressed according to the procedures described in this Site Contingency Plan.

Obvious signs of contamination in a contingency situation can include:

- Strong or unusual chemical odors during excavation (e.g., solvent, petroleum, etc.) that are different than encountered or expected during RAP implementation.
- Encountering unexpected industrial wastes such as tar, sludge, semisolids, powders, ash, or resins.
- Discolored soil that is different than encountered or expected during implementation of the RAP.
- Unexpected drums and/or containers.
- Objects such as vent pipes or wells.
- Unexpected asbestos-containing materials.
- Persons who suddenly become ill at the site (keep in mind that certain hazardous substances such as methane gas which is odorless and colorless cannot be detected visually or by smell).

## 2.0 Initial Actions

If the items above are observed unexpectedly during earthwork activities, the following actions must be taken:

1. IMMEDIATELY STOP WORK IN THE AREA OF UNEXPECTED CONTAMINATION, PROVIDE FOR WORKER SAFETY, AND SECURE THE AREA;
2. Contact the environmental professional responsible for overseeing RAP implementation if that person is onsite or contact Jennifer Brekken at Barr Engineering Co. (office: 952.832.2700; cell: 952.250.6005) or Dan Fetter at Barr Engineering Co. (office: 952.832.2741; cell: 612.581.4864).
3. Do not rebury the hazardous substances or petroleum products that are encountered. The area of any exposed hazardous substances or petroleum products must be secured.

## 3.0 Assessing the Situation

A Barr environmental professional will be responsible for inspecting the area of unexpected contamination or contingent situation and developing a plan of action that is consistent with this Site Contingency Plan. This may involve implementing measures to further secure the area (e.g., installing fencing or posting warning signs), collecting samples to identify the type and magnitude of contamination that is present, and placing test pits to help define the extent of contamination that is present.

The environmental professional responsible for managing the contingency situation or the client representative will contact the appropriate MPCA representative to make them aware of the situation and to determine the process for MPCA input and review of the plan to assess and manage the contingent action.

If the construction activities have caused a release of hazardous substances or petroleum products, or if contamination is identified that is not consistent with the RAP or has not otherwise been previously reported, that release must be reported within 24 hours to the MPCA through the Minnesota Duty Officer, Division of Emergency Management. Contacting the Duty Officer will fulfill obligations for the notification requirements under Minnesota Statute 115.061. The telephone number for the Duty Officer is 651-649-5451 (Metro) or 1-800-422-0798 (Greater Minnesota). TDD numbers are 651-297-5353 and 1-800-627-3529. The client representative or the environmental professional responsible for RAP implementation (not the onsite contractor) will be responsible for making the call to the Duty officer.

Once work in the area has stopped, the work site has been secured, the notification process has been implemented, the situation has been adequately assessed, and a plan of contingent action has been established, the RAP contractor will implement the contingent action (supplemented, if appropriate, by a properly trained or certified work crews for issues such as tank removal, asbestos containing materials handling, hazardous waste management, water well abandonment, etc.). Activities implemented through the Site Contingency Plan will only be performed by OSHA HAZWOPER-trained personnel with the proper licensing for any specialty work. Depending on the circumstances, it may be necessary to amend the existing Project Health and Safety Plan for the contingent work.

## 4.0 Contingent Actions

The following paragraphs describe the general contingent actions that will be taken in the event that unanticipated contamination or other contingent conditions are encountered during RAP implementation.

Specific requirements for the contractor as they relate to the implementation of contingent actions may include erosion control, runoff and runoff controls, air emission controls, decontamination facilities, notification procedures, construction on temporary contaminated soil stockpile area, and contaminated media profiling and treatment/disposal.

### 4.1 Dissimilar Contaminated Soils (not a RCRA-regulated hazardous waste)

Soils potentially containing hazardous substances or petroleum products that are different than identified in the RAP may be encountered during earthwork activities associated with implementation of the RAP. If, based upon visual or olfactory evidence, such materials are encountered during earthwork activities and if such conditions are determined to be inconsistent with previously identified conditions being managed in accordance with the RAP, excavation of the impacted area will cease until the appropriate regulatory agency is notified, samples are collected, results are reviewed, and a plan of action is developed as described in Sections 2.0 and 3.0 of this Site Contingency Plan.

General requirements are described in the following paragraphs.

- An environmental professional familiar with site conditions and the plan for contingent action will be present during excavation of the dissimilar soils to screen and classify the soils (based on appearance, odor and organic vapor headspace measurements) and to collect analytical samples for further characterization and for sidewall and base of excavation verification.
- A contaminated soil stockpile area will be constructed onsite by creating an impervious surface by placing plastic sheets (minimum 10-mil) on the ground or similar. A plastic cover (minimum 10-mil) will be placed over the stockpiled materials at the end of each work day and after excavation is complete and will be held in place with weights such as tires, bags of sand or clean soil. All plastic sheets will overlap at least 3 feet at seams. The contractor will be instructed to control all runoff from the stockpile area.
- After field screening indicates that the limits of the dissimilar material has been reached, soil samples will be collected from the base and sidewalls of the excavation in accordance with MPCA Site Remediation Section, Risk-Based Site Characterization and Sampling Guidance or in accordance with the verification sampling plan in the RAP. Soil samples will be analyzed for the appropriate parameters designated by the environmental professional in consultation with the MPCA based on the likely source and type of contamination and field observations. The results from the analysis of the verification samples will be compared to MPCA risk-based screening levels consistent with the land use anticipated for the site in the RAP. Unless otherwise negotiated between the voluntary party and the regulatory authorities in the RAP, the intent will be that excavation of contaminated soil will continue until appropriate risk-based cleanup levels are attained. The MPCA will be consulted regarding any issues associated with an inability to meet appropriate risk-based cleanup levels.
- Soil samples from the stockpiled contaminated soil will be collected in accordance with MPCA guidance and as necessary to complete waste profiling for disposal purposes after the material has been excavated. A plan for disposing of or otherwise managing the stockpiled soils will be prepared after the results from all the sampling are available.

## 4.2 RCRA-Regulated Hazardous Waste

Materials that are characterized as a RCRA-regulated hazardous waste and that are generated in the initial excavation will be containerized and temporarily stored onsite on an impervious surface in a secured area until disposal arrangements are determined. If practicable, the remaining hazardous waste will be left in place until disposal arrangements are made. The area of contamination must be secured with fencing and posted with warning signs. Storage on the site will not exceed a duration of 120 days once the material has been determined to be a hazardous waste.

All hazardous wastes will be stored, transported, treated and disposed of in accordance with all applicable rules and regulations. The general requirements for construction of the storage area, waste characterization, and confirmation sampling will be implemented as described in 4.1 of this section.

### 4.2.1 Stabilization of Lead Contaminated Soils

Soils exhibiting evidence of potential lead contamination (e.g. used battery casings) will be stockpiled and analyzed for toxicity characteristic leaching procedure (TCLP) lead to determine whether the soils are characteristically hazardous. Soils with TCLP lead results greater than 5 mg/L will be stabilized prior to removal from the site. The stabilization reagent will be mixed with soil using typical construction equipment (e.g. backhoe, excavator, bulldozer, and loader). The soil will be mixed during excavation or during staging and stockpiling. A bucket treatability test may be completed to determine the mix ratio of the stabilization reagent to the soil. It is anticipated that Enviroblend or a similar reagent will be used for soil stabilization. Following stabilization, the soil will be sampled and analyzed for TCLP lead and as required by the landfill. Soil will be re-stabilized and the stabilization mix will be adjusted until the TCLP lead result is less than RCRA characteristic limit of 5 mg/L.

### 4.3 Buried Drums or Containers

If drums or containers are encountered, they will be individually removed and their condition assessed. If the excavated drums and containers are not in good condition (e.g., severe rusting, structural defects, leaking, etc.), contents will be transferred to new drums, overpacks, or U.S. Department of Transportation (DOT)-approved containers. These containers will meet the appropriate requirements of U.S.DOT, OSHA and U.S.EPA regulations for the applicable materials.

Intact and repacked drums and containers will be transported to an onsite, secure, impervious storage area and/or placed in roll-off boxes. If appropriate, liquids may be removed from drums and containers and bulk-stored in tanks. Roll-off boxes will be lined to contain accumulated materials. The unused volume in the roll-off boxes will be sufficient to contain 10 percent of the volume of the drums or the volume of the largest container, whichever is greater. The roll-off boxes will be covered to prevent collection of precipitation.

Samples will be collected from the drums/containers and analyzed as appropriate to characterize the contents. After the contents of the drums/containers have been characterized, arrangements will be made for disposal. The disposal method will be discussed with the MPCA and will be implemented after regulatory agency approval.

Soil surrounding the buried tanks or containers will be managed in accordance with the RAP or in accordance with 4.1 of this section if they are dissimilar from those in the RAP.

### 4.4 Underground Storage Tanks

In the event an underground storage tank is unexpectedly encountered during an excavation associated with RAP implementation, work will be stopped and the property owner notified of the tank. Removal of the tank would be the responsibility of the property owner. The steps below outline a plan for removal conducted by others and is outside the scope of work for the erosion repair project:

- The Removal of the tank and excavation of any petroleum-contaminated soils in the tank basin should be conducted in accordance with MPCA Excavation of Petroleum-Contaminated Soil Guidance Document 3-01. The underground tank will be removed by an MPCA-certified underground storage tank contractor. Another work crew or contractor will likely need to be mobilized to the site.
- The storage tank contractor will confirm that the underground storage tank is isolated from all piping and that utilities in the area have been adequately located and marked and that they can be avoided as the tank and any contaminated soil is removed. To the maximum extent practicable, the tank excavation contractor will remove and containerize residual tank contents prior to tank excavation. Appropriately trained personnel will handle all residual tank contents in accordance with MPCA and OSHA requirements. Tank excavation and removal will be completed in a manner that minimizes the potential for spillage of residual tank contents. Temporary onsite storage of the removed tank will be on plastic sheeting (minimum of 10-mil) to prevent incidental soil contamination.
- In the event of a visible release of petroleum product or hazardous substances from the tank, assessment and notifications procedures described in Section 3.0 should be implemented and any resulting contaminated soil should be managed in accordance with procedures described in 4.1 of this section, or in accordance with an alternative plan developed by the property owner.

#### 4.5 Buried Debris Including Asbestos-Containing Waste Materials

Buried debris unexpectedly encountered during an excavation under the RAP that does not contain asbestos-containing material will be excavated, temporarily stored onsite, and disposed of in the same way that dissimilar contaminated soils are managed and as described in 4.1 of this section.

Buried debris sometimes contains asbestos-containing material (ACM). The environmental professional that is sent to assess the discovery of buried debris in a contingency situation will be trained in asbestos awareness as required for Class IV asbestos work.

If suspected ACM is identified by the asbestos awareness-trained environmental professional, the material will be sampled by a fully-certified and licensed asbestos inspector to help identify the proper separation, handling, and disposal of the material. If excavation of ACM is required, a licensed abatement asbestos contractor will be used to provide the proper handling and disposal of the ACM. This may mean that the RAP contractor's work crew will need to be supplemented with another work crew or that another contractor with specialized asbestos abatement licensing will need to be mobilized to the site. All asbestos-related work will be conducted in accordance with Minnesota and federal National Emission Standards for Hazardous Air Pollutants (NESHAP) requirements. Monitoring of airborne asbestos concentrations will be conducted in accordance with the OSHA, asbestos requirements for the construction industry (29 CFR 1926.1101 – adopted by reference by Minnesota OSHA).

An emission control plan will be prepared and implemented for the work if regulated quantities (over 260 lb, 160 sf or 35 cf) of ACM or ACM and soil mixture are encountered during the excavation activities. The

ACM contractor will use standard operating procedures during excavation and abatement work to ensure maximum protection and to safeguard workers, visitors, tenants, site employees and the environment.

#### 4.6 Water Accumulation in the Excavation

In the event an excavation must be dewatered during RAP activities and procedures describing this dewatering are not contained in the RAP, the contractor will first contain the water and then notify the environmental professional onsite or follow the notification procedures in Section 2.0 of this Plan. The water will be sampled by the environmental professional and the results of the sampling will be used to design a plan for treating and disposing of the water and acquiring the necessary permits for discharge to an approved facility (sanitary sewer, storm sewer, or other facility).

#### 4.7 Objects Such as Wells or Vent Pipes

In the event a metal vent pipe is uncovered during an excavation, the excavation will be continued to a depth of 10 to 15 feet below the ground surface to determine if the pipe is connected to a tank. If the pipe is not connected to a tank or if the feature appears to be a water well, a licensed water well contractor will be mobilized to permanently seal the well in accordance with state, county and local requirements and to file the appropriate paperwork to complete the sealing operation. If the feature is not a well or a potential downward conduit for contamination (e.g., an old piling, etc), it will be cut off at a reasonable depth and the location will be recorded with GPS coordinates

### 5.0 Documentation and Reporting

The implementation of the contingent actions will be documented and reported in the RAP Implementation Report in accordance with MPCA reporting requirements. The Implementation Report will include a text description of the contingent work with supporting documentation which may include tables summarizing the results of field screening and analytical sampling (including waste profile samples); figures documenting the location of contingent activities, a photo log, manifests for all waste disposed offsite, field notes, and laboratory analytical reports.

The Implementation Report will be submitted to the MPCA upon completion of the project and will provide the MPCA documentation that remedial actions, including contingent actions, were completed in accordance with the approved RAP and Site Contingency Plan.